

***FlyBy Math™* Alignment**
Kansas Curricular Standards for Mathematics
Jan 31, 2004

Standard 1: Number and Computation

Number and Computation – The student uses numerical and computational concepts and procedures in a variety of situations.

Benchmark 3: Estimation – The student uses computational estimation with rational numbers and the irrational number pi in a variety of situations.

<i>Eighth Grade Knowledge Base Indicators</i> The student...	<i>FlyBy Math™</i> Activities
2. estimates real number quantities using various computational methods including mental math, paper and pencil, concrete objects, and/or appropriate technology (2.4.K1a)	--Predict outcomes and explain results of mathematical models and experiments.
<i>Eighth Grade Application Indicators</i> The student...	<i>FlyBy Math™</i> Activities
1. adjusts original rational number estimate of a real-world problem based on additional information (a frame of reference)(2.4.A1a)	--Predict outcomes and explain results of mathematical models and experiments.
2. estimates to check whether or not the result of a real-world problem using rational numbers, the irrational number pi, and/or simple algebraic expressions is reasonable and makes predictions based on the information (2.4.A1a)	--Predict outcomes and explain results of mathematical models and experiments.
3. determines a reasonable range for the estimation of a quantity given a real-world problem and explains the reasonableness of the range(2.4.A1c)	--Predict outcomes and explain results of mathematical models and experiments.
4. determines if a real-world problem calls for an exact or approximate answer and performs the appropriate computation using various computational methods including mental math, paper and pencil, concrete objects, or appropriate technology (2.4.A1a)	--Predict outcomes and explain results of mathematical models and experiments. --Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.

Standard 2: Algebra

Algebra – The student uses algebraic concepts and procedures in a variety of situations.

Benchmark 1: Patterns – The student recognizes, describes, extends, develops, and explains the general rule of a pattern in a variety of situations.

<p><i>Eighth Grade Knowledge Base Indicators</i> The student...</p> <ol style="list-style-type: none"> identifies, states, and continues a pattern presented in various formats including numeric (list or table), algebraic (symbolic notation), visual (picture, table, or graph), verbal (oral description), kinesthetic (action), and written using these attributes: <ol style="list-style-type: none"> measurements (2.4.K1a) things related to daily life 	<p><i>FlyBy Math™ Activities</i></p> <p>--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.</p>
<p><i>Eighth Grade Application Indicators</i> The student...</p> <ol style="list-style-type: none"> generalizes numerical patterns using algebra and then translates between the equations, graph, and table of values resulting from the generalization (2.4.A1d-e,j) recognizes the same general pattern presented in different representations [numeric (list or table), visual (picture, table, or graph), and written] (2.4.A1a,j) 	<p><i>FlyBy Math™ Activities</i></p> <p>--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.</p> <p>--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.</p>

Benchmark 2: Variables, Equations, and Inequalities – The student uses variables, symbols, real numbers, and algebraic expressions to solve linear equations and inequalities in a variety of situations.

<p><i>Eighth Grade Knowledge Base Indicators</i> The student...</p> <ol style="list-style-type: none"> solves: (2.4.K1a,e) <ol style="list-style-type: none"> systems of linear equations with whole number coefficients and constants graphically 	<p><i>FlyBy Math™ Activities</i></p> <p>--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.</p> <p>--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.</p>
<ol style="list-style-type: none"> evaluates formulas using substitution 	<p>--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.</p> <p>--Use the distance-rate-time formula to predict and analyze aircraft conflicts.</p>

<i>Eighth Grade Application Indicators</i> The student... <p>1. represents real-world problems using (2.4.A1d): c. systems of linear equations with whole number coefficients and constants</p>	<i>FlyBy Math™ Activities</i> <p>--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.</p>
<i>Benchmark 3: Functions – The student recognizes, describes, and analyzes constant, linear, and nonlinear relationships in a variety of situations.</i>	
<i>Eighth Grade Knowledge Base Indicators</i> The student... <p>3. explains the concepts of slope and x- and y-intercepts of a line (2.4.K1g)</p>	<i>FlyBy Math™ Activities</i> <p>--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.</p> <p>--Interpret the slope of a line in the context of a distance-rate-time problem.</p>
<p>5. identifies ordered pairs from a graph, and/or plots ordered pairs using a variety of scales for the x- and y-axis (2.4.K1g)</p>	<p>--Plot points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system to describe the motion of two airplanes.</p>
<i>Eighth Grade Application Indicators</i> The student... <p>1. represents a variety of constant and linear relationships using written or oral descriptions of the rule, tables, graphs and symbolic notation(2.4.A1d-f)</p>	<i>FlyBy Math™ Activities</i> <p>--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.</p>
<p>2. interprets, describes, and analyzes the mathematical relationships of numerical, tabular, and graphical representations (2.4.A1j)</p>	<p>--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.</p>
<p>3. translates between the numerical, tabular, graphical and symbolic representations of linear relationships with integer coefficients and constants (2.4.A1a)</p>	<p>--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.</p>

Benchmark 4: Models – The student generates and uses mathematical models to represent and justify mathematical relationships in a variety of situations.

Eighth Grade Knowledge Base Indicators

The student...

1. knows, explains, and uses mathematical models to represent mathematical concepts, procedures, and relationships. Mathematical models include:
 - a. process models (concrete objects, pictures, diagrams, number lines, hundred charts, measurement tools, multiplication arrays, division sets, or coordinate grids) to model computational procedures, algebraic relationships and mathematical relationships and to solve equations;
 - f. function tables to model numerical and algebraic relationships;
 - g. coordinate planes to model relationships between ordered pairs and linear equations and inequalities;
 - k. frequency tables, bar graphs, line graphs, circle graphs, Venn diagrams, charts, tables, single and double stem-and-leaf plots, scatter plots and box-and-whisker plots, and histograms to organize and display data

FlyBy Math™ Activities

--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.

--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.

--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.

Eighth Grade Application Indicators

The student...

1. recognizes that various mathematical models can be used to represent the same problem situation. Mathematical models include:
 - a. process models (concrete objects, pictures, diagrams, number lines, hundred charts, measurement tools, multiplication arrays, division sets, or coordinate grids) to model computational procedures, algebraic relationships, mathematical relationships and problem situations and to solve equations;
 - e. function tables to model numerical and algebraic relationships;
 - f. coordinate planes to model relationships between ordered pairs and linear equations and inequalities;
 - j. frequency tables, bar graphs, line graphs, circle graphs, Venn diagrams, charts, tables, single and double stem-and-leaf plots, scatter plots, box-and-whisker plots, and histograms to describe, interpret, and analyze data

FlyBy Math™ Activities

--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.

--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.

3. uses the mathematical modeling process to analyze and make inferences about real-world situations	--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
--	---

Standard 3: Geometry

Geometry – The student uses geometric concepts and procedures in a variety of situations.

Benchmark 2: Measurement and Estimation – The student estimates, measures, and uses measurement formulas in a variety of situations.

<i>Eighth Grade Knowledge Base Indicators</i> The student...	<i>FlyBy Math™ Activities</i>
1. determines and uses rational number approximations (estimations) for length, width, weight, volume, temperature, time, perimeter, area and surface area using standard and nonstandard units of measure (2.4.K1a)	--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.
2. selects and uses measurement tools, units of measure, and level of precision appropriate for a given situation to find accurate rational number representations for length, weight, volume, temperature, time, perimeter, area, surface area and angle measurements. (2.4.K1a)	--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.
7. calculate rates of change	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios. --Interpret the slope of a line in the context of a distance-rate-time problem.
<i>Eighth Grade Application Indicators</i> The student...	<i>FlyBy Math™ Activities</i>
2. estimates to check whether or not measurements or calculations for length, weight, volume, temperature, time, perimeter, area, and surface area in real-world problems are reasonable and adjusts original measurement or estimation based on additional information (a frame of reference) (2.4.A1a)	--Predict outcomes and explain results of mathematical models and experiments. --Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.

Benchmark 4: Geometry From An Algebraic Perspective – The student relates geometric concepts to a number line a coordinate plane in a variety of situations.

<i>Eighth Grade Knowledge Base Indicators</i> The student...	<i>FlyBy Math™ Activities</i>
1. uses the coordinate plane to (2.4.K1a): a. list several ordered pairs on the graph of a line and find the slope of the line; e. solve simple systems of linear equations	--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system. --Interpret the slope of a line in the context of a distance-rate-time problem.

2. uses a given linear equation with integer coefficients and constants and a whole number solution to find the ordered pairs, organizes the ordered pairs using a T-table, and plot the ordered pairs on the coordinate plane (2.4.K1e-g).	<p>--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.</p> <p>--Plot points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system to describe the motion of two airplanes.</p>
<i>Eighth Grade Application Indicators</i> The student... <p>1. represents, generates, and/or solves distance problems (including the use of the Pythagorean theorem, but not necessarily the distance formula)(2.4.A1a)</p>	<i>FlyBy Math™ Activities</i> <p>--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.</p> <p>--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.</p> <p>--Use the distance-rate-time formula to predict and analyze aircraft conflicts.</p>
2. translates between the written, numeric, algebraic, and geometric representations of a real-world problem (2.4.A1a, d-g).	--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.

Standard 4: Data

Data – The student uses concepts and procedures of data analysis in a variety of situations.

Benchmark 2: Statistics – The student collects, organizes, displays, explains, and interprets numerical (rational) and non-numerical data sets in a variety of situations.

<i>Eighth Grade Knowledge Base Indicators</i> The student... <p>1. organizes, displays, and reads quantitative (numerical) and qualitative (non-numerical) data in a clear, organized, and accurate manner including a title, labels, categories, and whole number and decimal intervals using these data displays (2.4.K1k):</p> <p>b. bar, line, and circle graphs,</p> <p>d. charts and tables</p>	<i>FlyBy Math™ Activities</i> <p>--Represent distance, rate, and time data using tables, line plots, bar graphs, and line graphs.</p>
--	--